

HUMAN MILEAGE



STUDENTS WIN MORE THAN COMPETITION IN LATIN AMERICA

BY SCOTT ROARK

A NEW TROPHY, international respect, and memories that will last a lifetime – the Cal Poly Human Powered Vehicle Team brought it all back home this year from Maracaibo, Venezuela.

The team swept all categories in the first-ever American Society of Mechanical Engineers International HPV Competition, winning first place in design, a 1,200-meter sprint, and a 45-mile endurance race. Pedaling the “Matrix,” a streamlined recumbent bicycle built with advanced composite materials, the students blasted by the competition with a top speed of more than 40 miles per hour.

How did they do it? Inspiration and cutting-edge technology according to equipment technician George Leone who advised the team with professors Andrew Kean and Kim Shollenberger. Of course, a little hard work didn’t hurt either.

Students designed and built a carbon fiber-over-foam frame for lightweight strength and a carbon/Kevlar cover for rider protection and aerodynamics. The only metal on the HPV was in the bicycle components. “We push the students hard to be original,” said Leone. “It’s a unique design problem to integrate a person as an actual part of a machine.”

Composites combine two or more different materials to form a new material that is stronger than its individual parts. Leone offers a sheet of Styrofoam as an example. When you bend it, the sheet will easily break. However, applying masking tape to the top surface allows the Styrofoam to withstand

tension and be curved into a semi-circle.

Composites, on average, are approximately 50 percent lighter than standard metals such as aluminum, allowing a vehicle like Cal Poly’s HPV to move quickly with less effort. All modern aircraft are built mainly with composites. Most cars are not, but Leone predicts that will change as fuel efficiency becomes a primary concern. “Composites are the future,” he said. “Our students enter their careers with a huge advantage from learning to work with this technology.”

Leone traveled with eight team members to Venezuela for the contest. He reported it was a “great experience,” not only for Cal Poly students, but also for the South Americans, with whom the team shared ideas, technical expertise and information.

Andres Rondon, the Venezuelan student organizer of the event, emphasized that the Cal Poly team represented the United States not only as competitors, but also as goodwill ambassadors.

“Cal Poly’s HPV Team is amazing,” Rondon wrote in a thank-you e-mail. “The students gave an example of humanity and collaboration. Receiving their help was something we were not expecting. The event changed from just a racing competition to one of building bridges between different communities and cultures.”

Cal Poly competed with five other university teams from Caracas and Maracaibo, Venezuela, and Santiago, Chile. □